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10/757,518	01/15/2004	Pirjo Pasanen	59643.00360	4595

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SQUIRE, SANDERS & DEMPSEY L.L.P.
14TH FLOOR
8000 TOWERS CRESCENT
TYSONS CORNER, VA 22182

EXAMINER	
HOUSHMAND, HOOMAN	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/757,518	PASANEN ET AL.	
	Examiner	Art Unit	
	Hooman Houshmand	2619	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 November 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,12,15,18 and 21-53* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,12,15,18 and 21-53* is/are rejected.

7)☒ Claim(s) *1,21,23,24,28,32;35 and 40-50* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's amendments and accompanying remarks, filed on 11/16/2007, have been entered and fully considered. Claims 2-11, 13-14, 16-17, and 19-20 have been canceled. Claims 40-53 have been added. Claims 1, 12, 15, 18, 21-53 are now pending.

Claim Objections

2. Claim 32 is objected to because of the following informalities: On line 6, "subcarriers if greater" is recited; it appears - subcarriers is greater - was the intended limitation. Appropriate correction is required.

3. Claims 1, 21, 23, 24, 28, 32, 35, 40, 41 are objected to because of the following: The limitation, "the size of a set of sequential subcarriers is greater than the smallest coherence bandwidth of the plurality of the users", is comparing the size of a set with bandwidth. The units are not the same.

4. Claims 42-50 are objected to because of the following: The limitation, "*the size of a set of sequential subcarriers is about twice the smallest coherence bandwidth of the plurality of users",* is comparing the size of a set with bandwidth. The units are not the same.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1, 12, 15, 18, 21-53 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The limitation "the size of a set of sequential subcarriers is greater than the smallest coherence bandwidth of the plurality of users", is not described in the specification.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 12, 15, 18, 21-53 are rejected under 35 U.S.C. 102(e) as being anticipated by Walton (PGPUB: 20040081131).

Regarding **Claim 1**.

Walton teaches (Page 1, Para 5) *a method of allocating* (partitioning) *a plurality of sets of sequential subcarriers* (partitioning of overall system bandwidth into subbands) in a multicarrier (respective carrier) modulation communication system to a plurality of users (Page 1, Para 10), *the size* (Bandwidth) *of a set of sequential subcarriers is greater than the smallest coherence bandwidth of the users* (Page 3, Para [0032] the largest OFDM symbol that may be used is constrained by the coherence time of the wireless channel, which is the time over which the wireless channel is essentially constant: This means that the users can have a sequential subcarrier size up to a maximum size dependent on the coherence time of their respective channel. Page 2 [0031] size or duration of an OFDM symbol is dependent on the number of subbands, if the system bandwidth is divided into N subbands with the use of an N-point IFFT, then the resulting transformed symbol comprises N samples. Page 3 [0032] using an OFDM symbol with the largest size possible. In summary, Walton teaches the use of the largest number of subbands available. This is equivalent to a particular maximum bandwidth. The smallest coherence bandwidth for all of the channels is utilized to determine the frequency spacing between subbands, this ensures, Page 11 [0125], that the channel is essentially constant or flat over the frequency range. In conclusion, Walton teaches the use of the largest bandwidth for the sequential subcarriers: this will be larger than the smallest coherence bandwidth of all of the users; given the condition, that the maximum OFDM size being constrained by the channel coherence time, is met).

Regarding **Claim 2**. (Cancelled)

Regarding **Claim 3**. (Cancelled)

Regarding **Claim 4**. (Cancelled)

Regarding **Claim 5**. (Cancelled)

Regarding **Claim 6**. (Cancelled)

Regarding **Claim 7**. (Cancelled)

Regarding **Claim 8**. (Cancelled)

Regarding **Claim 9**. (Cancelled)

Regarding **Claim 10**. (Cancelled)

Regarding **Claim 11**. (Cancelled)

Regarding **Claim 12**.

Walton teaches (Page 3, Para 38) *the size of a set of sequential subcarriers comprises a power of two* (sizes are powers of two).

Regarding **Claim 13**. (Cancelled)

Regarding **Claim 14**. (Cancelled)

Regarding **Claim 15**.

Walton teaches (Page 1, Para 10) *within an allocation period each set* (reserved subband set) *of sequential subcarriers* (subbands) *is of the same size* (OFDM partitions the system bandwidth into a number of subbands Page 1, Para 5. The number of subbands is determined by the size of the IFFT Page 1, Para 6. The system bandwidth is divided into N subbands with the use of an N-point IFFT Page 2, Para 31).

Regarding **Claim 16**. (Cancelled)

Regarding **Claim 17**. (Cancelled)

Regarding **Claim 18**.

Walton teaches (Page 3, Para 32) *allocating* (size of the OFDM symbol) *the plurality of sets of sequential subcarriers* (subbands) *by taking into account channel properties* (coherence time) *of at least one user* (multiple users share the OFDM symbol Para 10).

Regarding **Claim 19**. (Cancelled)

Regarding **Claim 20**. (Cancelled)

Regarding **Claim 21**.

Walton teaches (Page 1, Para 5) *a device configured to allocate* (Para 10: allocating different sets of subbands to different users) *a plurality of sets of sequential subcarriers* (subbands) *in a multicarrier modulation* (OFDM) *communication system to a plurality of users* (Para 10: different users) *in an allocation period* (OFDM symbol period Para 29), *the size of a set of sequential subcarriers is greater than the smallest coherence bandwidth of the users* (Page 3, Para [0032] the largest OFDM symbol that may be used is constrained by the coherence time of the wireless channel, which is the time over which the wireless channel is essentially constant: This means that the users can have a sequential subcarrier size up to a maximum size dependent on the coherence time of their respective channel. [0031] size or duration of an OFDM symbol is dependent on the number of subbands, if the system bandwidth is divided into N subbands with the use of an N-point IFFT, then the resulting transformed symbol comprises N samples. [0032] using an OFDM symbol with the largest size possible. In summary, Walton teaches the use of the largest number of subbands available. This is equivalent to a particular maximum bandwidth. The smallest coherence bandwidth for all of the channels is utilized to determine the frequency spacing between subbands,

this ensures, [0125], that the channel is essentially constant or flat over the frequency range. In conclusion, Walton teaches the use of the largest bandwidth for the sequential subcarriers: this will be larger than the smallest coherence bandwidth of all of the users; given the condition, that the maximum OFDM size being constrained by the channel coherence time, is met).

Regarding **Claim 22**.

Walton teaches (Page 4, Para 48) *a network element, device, for a cellular* (mobile, wireless) *telecommunications network*.

Regarding **Claim 23**.

Walton teaches (Page 1, Para 10) *a multicarrier modulation communication system* (OFDM system Para 135) *configured to allocate* (allocating different disjoint sets of subbands to different users) *a plurality of sets of sequential subcarriers* (sets of subbands) *to a plurality of users* (allocating to different users) *in an allocation period* (OFDM symbol period Para 07), *the size of a set of sequential subcarriers is greater than the smallest coherence bandwidth of the users* (Page 3, Para [0032] the largest OFDM symbol that may be used is constrained by the coherence time of the wireless channel, which is the time over which the wireless channel is essentially constant: This means that the users can have a sequential subcarrier size up to a maximum size dependent on the coherence time of their respective channel. [0031] size or duration of an OFDM symbol is dependent on the number of subbands, if the system bandwidth is

divided into N subbands with the use of an N-point IFFT, then the resulting transformed symbol comprises N samples. [0032] using an OFDM symbol with the largest size possible. In summary, Walton teaches the use of the largest number of subbands available. This is equivalent to a particular maximum bandwidth. The smallest coherence bandwidth for all of the channels is utilized to determine the frequency spacing between subbands, this ensures, [0125], that the channel is essentially constant or flat over the frequency range. In conclusion, Walton teaches the use of the largest bandwidth for the sequential subcarriers: this will be larger than the smallest coherence bandwidth of all of the users; given the condition, that the maximum OFDM size being constrained by the channel coherence time, is met).

Regarding **Claim 24**.

Walton teaches (Page 1, Para 10) *transmitting at least one signal* (transmitting at least a packet Para 11) *relating to at least one set of sequential subcarriers* (subbands) *in a multicarrier modulation communication system* (OFDM system Para 135) *among a plurality of sets of sequential subcarriers* (sets of subbands) *allocated* (allocating different sets of subbands to different users) *in an allocation period* (OFDM symbol period Para 07) *to a plurality of users* (allocating to different users), *the size of a set of sequential subcarriers is greater than the smallest coherence bandwidth of the users* (Page 3, Para [0032] the largest OFDM symbol that may be used is constrained by the coherence time of the wireless channel, which is the time over which the wireless channel is essentially constant: This means that the users can have a sequential

subcarrier size up to a maximum size dependent on the coherence time of their respective channel. [0031] size or duration of an OFDM symbol is dependent on the number of subbands, if the system bandwidth is divided into N subbands with the use of an N-point IFFT, then the resulting transformed symbol comprises N samples. [0032] using an OFDM symbol with the largest size possible. In summary, Walton teaches the use of the largest number of subbands available. This is equivalent to a particular maximum bandwidth. The smallest coherence bandwidth for all of the channels is utilized to determine the frequency spacing between subbands, this ensures, [0125], that the channel is essentially constant or flat over the frequency range. In conclusion, Walton teaches the use of the largest bandwidth for the sequential subcarriers: this will be larger than the smallest coherence bandwidth of all of the users; given the condition, that the maximum OFDM size being constrained by the channel coherence time, is met).

Regarding **Claim 25**.

Walton teaches *allocating the plurality of sets of sequential subcarriers* (Page 1, Para 10: allocating sets of subbands to different users) *for transmitting information to the plurality of users*.

Regarding **Claim 26**.

Walton teaches *transmitting a plurality of signals* (Page 8, Para 84: transmitted downlink signals) *to the plurality of users* (Page 8, Para 84: each user terminal).

Regarding **Claim 27**.

Walton teaches (Page 1, Para 10) *allocating the plurality of sets of sequential subcarriers* (allocating different disjoint sets of subbands to different users Page 1, Para 10) *for transmitting information from* (techniques for uplink using OFDM symbols Para 134) *the plurality of users* (allocating to different users).

Regarding **Claim 28**.

Walton teaches (Page 1, Para 10) *receiving at least one signal* (reference received on a subband Para 122 Page 10) *relating to at least one set of sequential subcarriers* (subbands) *among a plurality of sets of sequential subcarriers* (sets of subbands) *allocated to a plurality of users* (allocating different sets of subbands to different users) *in an allocation period* (OFDM symbol period Para 07), *the size of a set of sequential subcarriers is greater than the smallest coherence bandwidth of the users* (Page 3, Para [0032] the largest OFDM symbol that may be used is constrained by the coherence time of the wireless channel, which is the time over which the wireless channel is essentially constant: This means that the users can have a sequential subcarrier size up to a maximum size dependent on the coherence time of their respective channel. [0031] size or duration of an OFDM symbol is dependent on the number of subbands, if the system bandwidth is divided into N subbands with the use of an N-point IFFT, then the resulting transformed symbol comprises N samples. [0032] using an OFDM symbol with the largest size possible. In summary, Walton teaches the use of the largest

number of subbands available. This is equivalent to a particular maximum bandwidth. The smallest coherence bandwidth for all of the channels is utilized to determine the frequency spacing between subbands, this ensures, [0125], that the channel is essentially constant or flat over the frequency range. In conclusion, Walton teaches the use of the largest bandwidth for the sequential subcarriers: this will be larger than the smallest coherence bandwidth of all of the users; given the condition, that the maximum OFDM size being constrained by the channel coherence time, is met).

Regarding **Claim 29**.

Walton teaches (Page 1, Para 10) *allocating the plurality of sets of sequential subcarriers* (allocating different sets of subbands to different users) *for receiving* (uplinked signals are received by antennas Para 88 Page 8) *information from the plurality of users* (allocating to different users).

Regarding **Claim 30**.

Walton teaches (Page 8, Para 88) *receiving a plurality of signals* (uplinked signals are received Para 88 Page 8) *from the plurality of users* (uplink from a user terminal Para 70, uplinks from user terminals Para 51).

Regarding **Claim 31**.

Walton teaches (Page 1, Para 10) *allocating the plurality of sets of sequential subcarriers* (allocating different sets of subbands to different users) *for receiving*

information (communication link to the user terminal Para 48, Page 4) *in the plurality of users* (allocating to different users).

Regarding **Claim 32**.

Walton teaches (Page 1, Para 10) *a device* (mobile station, wireless device Para 48) *configured to transmit at least one signal* (transmitting at least a packet Para 11) *relating to at least one set of sequential subcarriers among a plurality of sets of sequential subcarriers* (subbands) *allocated to the plurality of users* (allocating different sets of subbands to different users) *in an allocation period* (OFDM symbol period Para 07), *the size of a set of sequential subcarriers is greater than the smallest coherence bandwidth of the users* (Page 3, Para [0032] the largest OFDM symbol that may be used is constrained by the coherence time of the wireless channel, which is the time over which the wireless channel is essentially constant: This means that the users can have a sequential subcarrier size up to a maximum size dependent on the coherence time of their respective channel. [0031] size or duration of an OFDM symbol is dependent on the number of subbands, if the system bandwidth is divided into N subbands with the use of an N-point IFFT, then the resulting transformed symbol comprises N samples. [0032] using an OFDM symbol with the largest size possible. In summary, Walton teaches the use of the largest number of subbands available. This is equivalent to a particular maximum bandwidth. The smallest coherence bandwidth for all of the channels is utilized to determine the frequency spacing between subbands, this ensures, [0125], that the channel is essentially constant or flat over the frequency

range. In conclusion, Walton teaches the use of the largest bandwidth for the sequential subcarriers: this will be larger than the smallest coherence bandwidth of all of the users; given the condition, that the maximum OFDM size being constrained by the channel coherence time, is met).

Regarding **Claim 33**.

Walton teaches (Page 1, Para 10) *plurality of sets of sequential subcarriers is allocated for transmitting information* (techniques for uplink using OFDM symbols Para 134) *to the plurality of users* (allocating different sets of subbands to different users).

Regarding **Claim 34**.

Walton teaches (Page 1, Para 10) *plurality of sets of sequential subcarriers is allocated for transmitting information from the plurality of users* (allocating different sets of subbands to different users), *the device corresponding to at least one of the users* (A user terminal also referred to as an access terminal, a mobile station, a user equipment (UE), a wireless device Para 48).

Regarding **Claim 35**.

Walton teaches (Page 1, Para 10) *a device configured* (OFDM symbol size for each time segment configured Para 40 Page 3) *to receive* (receiver Para 130, Page 11) *at least one signal relating to at least one set of sequential subcarriers* (subbands) *among a plurality of sets of sequential subcarriers allocated to a plurality of users* (allocating

different sets of subbands to different users) *in an allocation period* (OFDM symbol period Para 07), *the size of a set of sequential subcarriers is greater than the smallest coherence bandwidth of the users* (Page 3, Para [0032] the largest OFDM symbol that may be used is constrained by the coherence time of the wireless channel, which is the time over which the wireless channel is essentially constant: This means that the users can have a sequential subcarrier size up to a maximum size dependent on the coherence time of their respective channel. [0031] size or duration of an OFDM symbol is dependent on the number of subbands, if the system bandwidth is divided into N subbands with the use of an N-point IFFT, then the resulting transformed symbol comprises N samples. [0032] using an OFDM symbol with the largest size possible. In summary, Walton teaches the use of the largest number of subbands available. This is equivalent to a particular maximum bandwidth. The smallest coherence bandwidth for all of the channels is utilized to determine the frequency spacing between subbands, this ensures, [0125], that the channel is essentially constant or flat over the frequency range. In conclusion, Walton teaches the use of the largest bandwidth for the sequential subcarriers: this will be larger than the smallest coherence bandwidth of all of the users; given the condition, that the maximum OFDM size being constrained by the channel coherence time, is met).

Regarding **Claim 36**.

Walton teaches (Page 1, Para 10) *plurality of sets of sequential subcarriers* (subbands) *is allocated for receiving information* (communication link to the user terminal Para 48,

Page 4) *from the plurality of users* (allocating different sets of subbands to different users).

Regarding **Claim 37**.

Walton teaches (Page 1, Para 10) *plurality of sets of sequential subcarriers* (subbands) *is allocated for receiving information in the plurality of users* (allocating different sets of subbands to different users), *the device corresponding to at least one of the users* (A user terminal also referred to as an access terminal, a mobile station, a user equipment (UE), a wireless device Para 48 Page 4).

Regarding **Claim 38**.

Walton teaches (Page 1, Para 10) *the device further configured* (OFDM symbol size for each time segment may be configured Para 40 Page 3) *to allocate the plurality of sets of sequential subcarriers* (allocating different sets of subbands).

Regarding **Claim 39**.

Walton teaches (Para 48 Page 4) *the device* (a mobile station, a wireless device) *is for a cellular telecommunications network* (MIMO-OFDM system).

Regarding **Claim 40**. Walton teaches *a transmitter* (Fig 9A [0094]), *allocating* (partitioning) *a plurality of sets of sequential subcarriers* (partitioning of overall system bandwidth into subbands) in a multicarrier (respective carrier) modulation

communication system to a plurality of users (Page 1, Para 10), *the size* (Bandwidth) *of a set of sequential subcarriers is greater than the smallest coherence bandwidth of the users* (Page 3, Para [0032] the largest OFDM symbol that may be used is constrained by the coherence time of the wireless channel, which is the time over which the wireless channel is essentially constant: This means that the users can have a sequential subcarrier size up to a maximum size dependent on the coherence time of their respective channel. [0031] size or duration of an OFDM symbol is dependent on the number of subbands, if the system bandwidth is divided into N subbands with the use of an N-point IFFT, then the resulting transformed symbol comprises N samples. [0032] using an OFDM symbol with the largest size possible. In summary, Walton teaches the use of the largest number of subbands available. This is equivalent to a particular maximum bandwidth. The smallest coherence bandwidth for all of the channels is utilized to determine the frequency spacing between subbands, this ensures, [0125], that the channel is essentially constant or flat over the frequency range. In conclusion, Walton teaches the use of the largest bandwidth for the sequential subcarriers: this will be larger than the smallest coherence bandwidth of all of the users; given the condition, that the maximum OFDM size being constrained by the channel coherence time, is met).

Regarding **Claim 41**. Walton teaches *a receiver* ([0084] user terminal), *to receive sets of sequential subcarriers* (partitioning of overall system bandwidth into subbands) in a multicarrier (respective carrier) modulation communication system to a plurality of users

(Page 1, Para 10), *the size* (Bandwidth) *of a set of sequential subcarriers is greater than the smallest coherence bandwidth of the users* (Page 3, Para [0032] the largest OFDM symbol that may be used is constrained by the coherence time of the wireless channel, which is the time over which the wireless channel is essentially constant: This means that the users can have a sequential subcarrier size up to a maximum size dependent on the coherence time of their respective channel. [0031] size or duration of an OFDM symbol is dependent on the number of subbands, if the system bandwidth is divided into N subbands with the use of an N-point IFFT, then the resulting transformed symbol comprises N samples. [0032] using an OFDM symbol with the largest size possible. In summary, Walton teaches the use of the largest number of subbands available. This is equivalent to a particular maximum bandwidth. The smallest coherence bandwidth for all of the channels is utilized to determine the frequency spacing between subbands, this ensures, [0125], that the channel is essentially constant or flat over the frequency range. In conclusion, Walton teaches the use of the largest bandwidth for the sequential subcarriers: this will be larger than the smallest coherence bandwidth of all of the users; given the condition, that the maximum OFDM size being constrained by the channel coherence time, is met).

Regarding **Claims 42-50**. Walton teaches *the size* (bandwidth) *of a set of sequential subcarriers is about twice the smallest coherence bandwidth of the plurality of users.* (Page 3, Para [0032] the largest OFDM symbol that may be used is constrained by the coherence time of the wireless channel, which is the time over which the wireless

channel is essentially constant: This means that the users can have a sequential subcarrier size up to a maximum size dependent on the coherence time of their respective channel. [0031] size or duration of an OFDM symbol is dependent on the number of subbands, if the system bandwidth is divided into N subbands with the use of an N-point IFFT, then the resulting transformed symbol comprises N samples. [0032] using an OFDM symbol with the largest size possible. In summary, Walton teaches the use of the largest number of subbands available. This is equivalent to a particular maximum bandwidth. The smallest coherence bandwidth for all of the channels is utilized to determine the frequency spacing between subbands, this ensures, [0125], that the channel is essentially constant or flat over the frequency range. In conclusion, Walton teaches the use of the largest bandwidth for the sequential subcarriers: this includes a bandwidth about twice the smallest coherence bandwidth of all of the users; given the condition, that the maximum OFDM size being constrained by the channel coherence time, is met).

Regarding **Claim 51**. Walton teaches *channel properties include the channel response for each set* (channel response matrices page 11 [0131]).

Regarding **Claim 52**. Walton teaches *channel response for a set is measured for one of the plurality of subcarriers of the set* (channel response for each subband page 10 [0104]).

Regarding **Claim 53**. Walton teaches *channel response for a set is measured at the lowest subcarrier of the set* (since the channel response is measured for each subband, this would include the lowest subband page 10 [0104]).

Response to Arguments

8. Applicant's arguments filed on 11/16/2007 have been fully considered but they are not persuasive.

9. The main argument is that Walton does not teach the new amended limitation: the *size of a set of sequential subcarriers is greater than the smallest coherence bandwidth of the users*. The examiner respectfully disagrees: Walton teaches *the size* (Bandwidth) *of a set of sequential subcarriers is greater than the smallest coherence bandwidth of the users* (Page 3, Para [0032] the largest OFDM symbol that may be used is constrained by the coherence time of the wireless channel, which is the time over which the wireless channel is essentially constant: This means that the users can have a sequential subcarrier size up to a maximum size dependent on the coherence time of their respective channel. Page 2 [0031] size or duration of an OFDM symbol is dependent on the number of subbands, if the system bandwidth is divided into N subbands with the use of an N-point IFFT, then the resulting transformed symbol comprises N samples. Page 3 [0032] using an OFDM symbol with the largest size possible. In summary, Walton teaches the use of the largest number of subbands available. This is equivalent to a particular maximum bandwidth. The smallest coherence bandwidth for all of the channels is utilized to determine the frequency

spacing between subbands, this ensures, Page 11 [0125], that the channel is essentially constant or flat over the frequency range. In conclusion, Walton teaches the use of the largest bandwidth for the sequential subcarriers: this will be larger than the smallest coherence bandwidth of all of the users; given the condition, that the maximum OFDM size being constrained by the channel coherence time, is met).

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hooman Houshmand whose telephone number is 571-270-1817. The examiner can normally be reached on Monday - Friday 8 to 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on (571) 272-3088. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HH

Hooman Houshmand
Patent Examiner
December 27, 2007

HASSAN KIZOU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600